REMARKS

Claims 1-42 are pending in the application.

Claims 1-29 and 31-32 stand rejected.

Claims 33-42 are allowed.

Claim 30 is objected to.

Appreciation is expressed for the indication of allowance of claims 33-42. However, at this time Applicant will take the opportunity to traverse the Examiner's rejections of the other claims.

Claim Objections

Claim 30 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicant chooses to defer amendment of claim 30 at this time to take the opportunity to traverse the Examiner's rejections.

Rejection of Claims under 35 U.S.C. §102

Claims 1-3 and 11 stand rejected under 35 U.S.C. §102(b) as being anticipated by A.A. Al-Jumah and T. Arslan, *Artificial Neural Network Based Multiple Fault Diagnosis in Digital Circuits,* IEEE, 1998 (Al-Jumah). Applicant respectfully traverses this rejection.

Applicant submits that claim 1 is distinguishable over Al-Jumah because Al-Jumah does not teach "training checking circuitry to selectively classify future input vectors to the digital hardware block as either good or not good." The Examiner suggests that Al-Jumah's technique for training an Artificial Neural Network (ANN) to perform fault diagnosis reads on the

foregoing limitation of claim 1. Performing "fault diagnosis" does not show, teach or suggest "selectively classify[ing] future input vectors," which is clear from the definition of fault diagnosis provided by Al-Jumah. According to Al-Jumah, "fault diagnosis is to detect and isolate the faulty components [of a digital circuit]." (page II-304, column 1, lines 29-30). An ANN trained only to "detect and isolate faulty components" would not be trained to classify input to the digital circuit. Therefore, Al-Jumah's discussion of training an ANN to perform fault diagnosis does not show, teach or suggest training checking circuitry to "selectively classify future inputs," as recited in claim 1.

The portions of Al-Jumah cited in the Office action clearly indicate that Al-Jumah's ANN is not trained to selectively classify future input vectors. As mentioned in the abstract of Al-Jumah, "the paper describes a technique, based on the use of Artificial Neural Networks (ANNs), for the diagnosis of multiple faults in digital circuits." In order to generate an ANN that can diagnose multiple faults, the ANN is trained with single fault data. (page II-304, column 2, lines 36-38). Then, multiple fault data, which is compiled by randomly inserting two faults in the digital circuit, is sent to the ANN. For each multiple fault data string sent to the ANN, the ANN outputs either a 1 or a 0 for each gate in the digital circuit (1 indicating that the gate is faulty and 0 indicating that the gate is not faulty). In other words, the ANN is trained to indicate whether the gates in a digital circuit are faulty but does not classify the multiple fault data strings, or any other input data, as either good or not good. Therefore, Al-Jumah fails to teach "training checking circuitry to selectively classify future input vectors to the digital hardware block as either good or not good," as recited in claim 1.

Applicant respectfully submits that claim 1 clearly distinguishes over Al-Jumah; therefore, Applicant submits that independent claim 1, as well as claims 2, 3 and 11, which

depend on claim1, are allowable for at least the foregoing reasons. Applicant respectfully

requests withdrawal of the rejections based upon 35 U.S.C. §102(b). Accordingly, Applicant

respectfully submits that claims 1-3 and 11 are in condition for allowance.

Rejection of Claims under 35 U.S.C. §103: Al-Jumah in view of Kung

Claims 4-9, 12, 20-27, 29, 31 and 32 stand rejected under 35 U.S.C. §103(a) as being

unpatentable over Al-Jumah, as applied to Claims 1-3 and 11, and further in view of S.Y. Kung,

Digital Neural Networks, Chapter 2, pages 43-72, Prentice Hall, January 1988 (Kung).

Applicant respectfully traverses this rejection.

Applicant respectfully submits that claims 4-9 and 12, which depend on claim 1, are

allowable for at least the reasons mentioned in the previous discussion of Al-Jumah.

Applicant submits that claim 20 is distinguishable over Al-Jumah in view of Kung. As

previously noted, Al-Jumah does not disclose "selectively classifying future input vectors to the

digital hardware block as either good or not good," as recited in claim 20. Applicant also

submits that neither Al-Jumah nor Kung disclose "a weight matrix having elements which are

based on a set of known bad input vectors," as claimed in claim 20. Regarding the foregoing

limitation, the Examiner states, "Kung teaches the use of a discrete Hopfield network algorithm

to create a weight matrix." (Office action, dated December 8, 2004, page 8). However, it is

clear from Kung's discussion of discrete Hopfield networks that using a "discrete Hopfield

network algorithm to create a weight matrix" does not show, teach or suggest that the weight

matrix has elements which are based on a set of known bad input vectors. Kung's discussion of

the discrete Hopfield network algorithm includes an overview of the "retrieving phase" and

"convergence" of such an algorithm, but fails to disclose a weight matrix with elements which

are based on a set of known bad input vectors. (pages 64-65, section 2.3.5). Therefore, the combination of Al-Jumah and Kung does not establish a prima facie case of obviousness because even a combination of the references fails to teach all the limitations of claim 20.

Furthermore, Applicant is unable to find any motivation to combine Al-Jumah and Kung to provide the limitations of claim 20. This is because, at least in part, neither reference recognizes the problem addressed by the claimed invention. Al-Jumah focuses on providing fault diagnosis in a digital circuit but fails to address the possibility of using an ANN to classify future input vectors. Chapter 2 of Kung presents several fixed-weight association networks without discussing specific applications of such networks. Therefore, neither reference recognizes the need for circuitry that classifies future input vectors to the digital hardware block as either good or not good, and could not be expected to provide motivation for combining the references to set forth such a limitation.

Additionally, the only motivation the Examiner presents for combining the disclosures of Al-Jumah and Kung is set forth in the rejection of claim 4. The Examiner states, "Kung teaches the use of a feedforward linear associative memory to train a neural network. It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify Al-Jumah as taught by Kung for the purpose of designing a network to retrieve patterns in one shot." (Office action, dated December 8, 2004, page 5). Applicant submits that the Examiner's argument does not apply to claim 20 because claim 20 does not contain the limitation of a "feedforward linear associative memory."

Applicant respectfully submits that claim 20 clearly distinguishes over Al-Jumah in view of Kung. Applicant therefore respectfully submits that independent claim 20, as well as claims 21-27, 29 and 31-32, which depend on claim 20, are allowable for at least the foregoing reasons.

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Applicant respectfully requests withdrawal of the rejections based upon 35 U.S.C. §103(a).

Accordingly, Applicant submits that claims 20-27, 29 and 31-32 are in condition for allowance.

Rejection of Claims under 35 U.S.C. §103: Al-Jumah in view of Ton

Claims 10 and 13-15 stand rejected under 35 U.S.C. §103(a) as being unpatentable over

Al-Jumah, as applied to claims 1-3 and 11 above, and further in view of Ton, U.S. Patent No.

6,771,623 (Ton). Applicant respectfully traverses this rejection.

Applicant respectfully submits that claim 10, which depends on claim 1, is allowable for

at least the reasons mentioned in the previous discussion of claim 1.

Applicant also submits that claim 13 is distinguishable over Al-Jumah in view of Ton.

As previously mentioned, Al-Jumah fails to disclose selectively classifying future input vectors

to the faulty hardware block as either good or not good. Furthermore, Applicant submits that one

of ordinary skill in the art would not be motivated to combine the disclosures of Al-Jumah and

Ton to provide the limitations of claim 13. The Office action states, "It would have been

obvious at the time the invention was made to a person having ordinary skill in the art to modify

Al-Jumah as taught by Ton for the purpose of providing redundancy to minimize the service

interruption time." Applicant submits that one of ordinary skill in the art would not be motivated

to combine Al-Jumah and Ton to provide "redundancy to minimize the service interruption."

The cited portions of Al-Jumah do not suggest that Al-Jumah is concerned with

minimizing service interruption time. Rather, Al-Jumah "describes a technique…for the

diagnosis of multiple faults in digital circuits." (Abstract). Furthermore, one of ordinary skill in

the art would not be motivated to combine Al-Jumah and Ton to provide a software workaround

for a hardware block within a programmable logic circuit because Ton provides redundancy for

"recover[ing] from Home Agent failure." (Abstract). According to Ton, "A Home Agent is a router on a Mobile Node's home network which tunnels datagrams for delivery to the Mobile Node when it is away from home, and maintains current location information for the Mobile node." (column 1, lines 64-67). One of ordinary skill in the art would not have been motivated to use software redundancy for recovering from a router failure, as disclose in Ton, to provide a software workaround for a faulty hardware block within a programmable circuit, as recited in claim 20.

Applicant respectfully submits that claim 13 clearly distinguishes over Al-Jumah in view of Ton. Applicant therefore respectfully submits that independent claim 13, as well as claims 14 and 15, which depend on claim 13, are allowable for at least the foregoing reasons. Applicant therefore respectfully requests withdrawal of the rejections based upon 35 U.S.C. §103(a). Accordingly, Applicant submits that claims 13-15 are in condition for allowance.

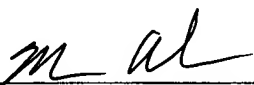*Rejection of Claims under 35 U.S.C. §103: Al-Jumah in view of Ton and Kung*

Claims 16-19 and 28 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Al-Jumah, as applied to Claims 1-3 and 11 above, in view of Ton as applied to claims 10, 13-15, and further in view of Kung. Applicant respectfully traverses this rejection.

Applicant submits that claims 16-19, which depend on claim 13, are allowable for at least the reasons mentioned in the previous discussion of claim 13.

Applicant submits that claim 28, which depends on claim 20, is allowable for at least the reasons mentioned in the previous discussion of claim 20.

CONCLUSION

In view of the amendments and remarks set forth herein, the application is believed to be in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is invited to telephone the undersigned at 512-439-5084.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on February 24, 25 2005.

_____   2/25/05
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